

05-250 Removal and installation of valve springs

Valve clearance	engine cold (approx. 20 °C)	engine hot (60 °C ± 15 °C)
Intake	0.10 ¹⁾	0.15 ¹⁾
Exhaust	0.30	0.35

¹⁾ 0.05 mm greater for steady ambient temperatures below -20 °C.

Tightening torques	Nm	(kpm)
Bolts for cylinder head cover (engine 615)	5	(0.5)
Nuts for cylinder head cover (engines 615, 616, 617.91)	15	(1.5)
Rocker arm bracket to cylinder head	38	(3.8)

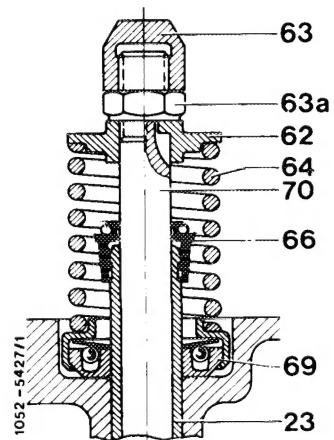
Special tools		
Valve adjusting wrench 14 mm (two)		615 589 00 01 00
Holding wrench for valve spring cap		615 589 00 03 00
Socket 27 mm, 1/2" drive to crank engine		001 589 65 09 00
Remote starter switch for cranking engine (individual component of compression pressure recorder 001 589 46 21 00)		001 589 46 21 08

Note

Each valve has a valve spring (64) and a Rotocap (69).

On engines with high mileages it is advisable to replace the Rotocaps at the same time

23 Valve guide	66 Valve steam seal
62 Valve spring cap	69 Rotocap
63 Cap nut	70 Valve
63a Lock-nut	
64 Valve spring	



Uprated engines have stronger valve springs (05–260).

The valve spring as per part No. 180 053 06 20 must not be used in these engines.

In contrast, normal power engines will also accept the valve spring as per part No. 615 053 01 20 from the uprated engines.

Marking:

Valve spring, part No. 180 053 06 20, two green or violet-green dots.

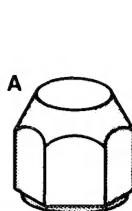
Valve spring, part No. 615 053 01 20, two yellow or violet-yellow dots.

Replace any damaged cap nut (63).

The cap nuts are available in three versions:

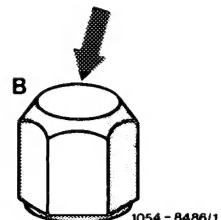
1st version

Cap nut with small contact surface (A).



2nd version

Cap nut thicker and larger at top (B).



3rd version

Cap nut thicker at top and hard chrome-plated.

Marking: Silver-colored.

Engines with chilled casting camshafts and hard-backed rocker arms require the version with hard chrome plating.

Cap nuts with hard chrome plating may also be used in engines which have tempered camshafts and rocker arms with induction-hardened and hard chrome-plated surfaces.

In future, the Esslingen-Mettingen spare parts division will supply only the version finished in hard chrome plating.

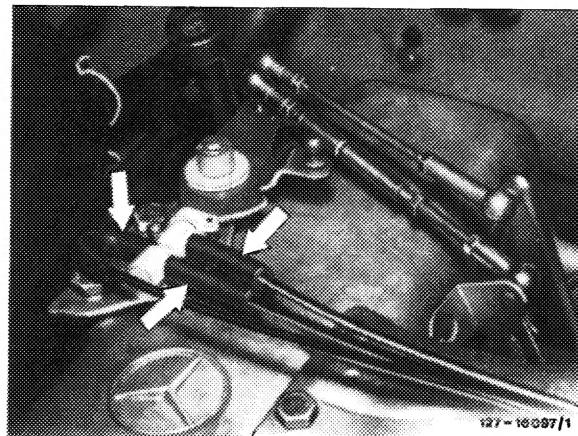
Removal

1 Remove cylinder head cover.

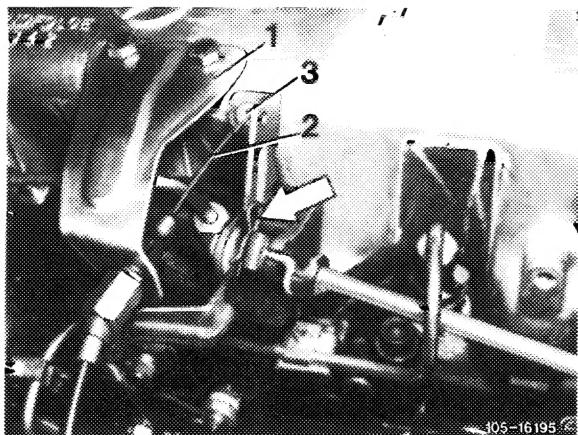
On vehicles with automatic transmissions and vacuum-controlled modulating pressure, additionally disconnect vacuum lines at switch-over valve.

Caution:

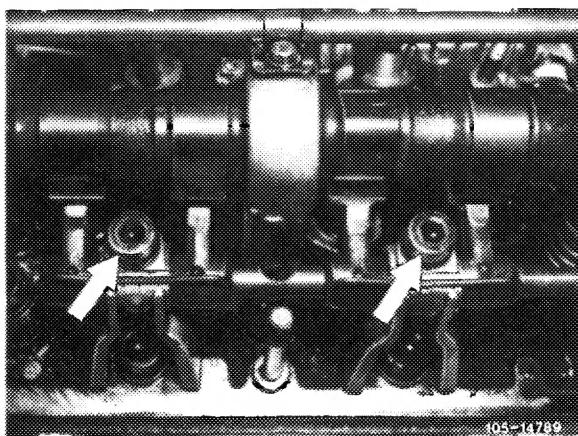
Be sure not to cross vacuum lines. The pipe unions and vacuum lines are color coded.



On engines with longitudinal control spindles, detach all control rods. Withdraw retainer (arrow) and force longitudinal control spindle in aft direction. Unscrew bracket (1) and unclip idle control cable (2) with plastic sleeve (3).

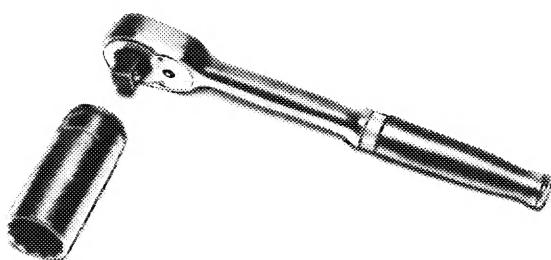


2 Remove rocker arms and rocker arm brackets (05-235).



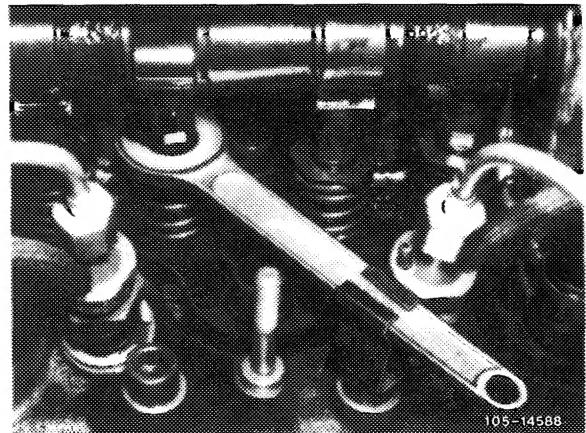
3 Turn piston of wanted cylinder to TDC.

Using tool combination, turn crankshaft for this purpose.



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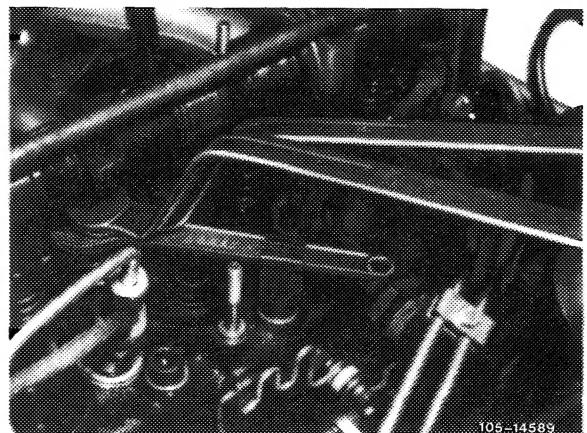
4 Apply holding wrench to valve spring cap.



5 Unscrew cap nut (63), using valve adjusting wrench.

For this purpose secure lock-nut (63a) with second valve adjusting wrench.

6 Unscrew lock-nut (63a).

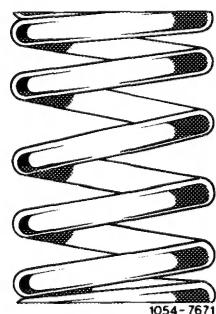


7 Remove valve spring cap and valve spring.

8 Check valve spring, replacing according to condition (05-260).

Installation

9 Insert valve spring so that tighter turns are pointing towards cylinder head (dots at top).



10 Fit valve spring cap.

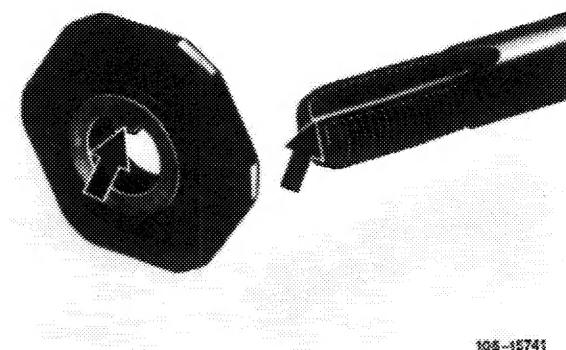
Lug on valve spring cap (arrow) must rest in valve stem groove.

11 Put lock-nut and cap nut on.

12 Install rocker arms and rocker arm brackets (05-235).

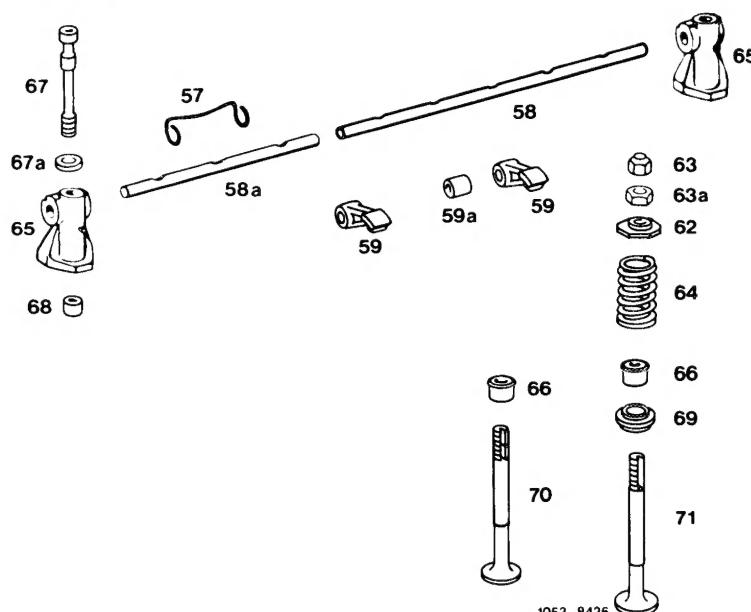
13 Adjust valve clearance (05-210).

14 Fit cylinder head cover.



105-45741

Valve timing



1053-8426

57	Tension spring	65	Bearing bracket
58	Rocker shaft	66	Valve stem seals
58a	Rocker shaft	67	Bolt
59	Rocker arm	67a	Washer
59a	Rocker arm bushing	68	Locating sleeve
62	Valve spring cap	69	Rotocap
63	Cap nut	70	Intake valve
63a	Lock-nut	71	Exhaust valve
64	Valve spring		